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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/657,114 | 09/09/2003 | Michael Tsai | 4504-012A | 5216 |

7590 06/23/2004

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EXAMINER

VU, TUAN A

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| ART UNIT | PAPER NUMBER |
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2124

DATE MAILED: 06/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/657,114

Applicant(s)

TSAI ET AL.

Examiner

Tuan A Vu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-16(claims 1-10 canceled) is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2003/09/09.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is responsive to the application filed September 9, 2003.

Claims 11-16 have been submitted for examination.

Specification

2. The disclosure is objected to because of the following informalities: the specification is replete with grammatical errors or improper usage of verbs or terms leading to unclear meaning. Following are a few examples of those improper uses of terms or grammatical erroneous constructs.

“...is almost performed by the computer” (pg. 1, 2nd para – Note: ‘is performed’ or ‘is not performed’ would be clear but ‘almost performed’ is unclear)

“... will read the upgraded firmware data” (pg. 1 2nd para – Note: upgraded should be upgrade because the firmware data is use for upgrade thus is not object for being upgraded)

“via the variable interfaces” (pg. 1, 2nd para – Note: these interfaces are introduced for the first time, hence using ‘the’ is not appropriate)

“and it incur the failure in writing ...” (pg. 2, 2nd para – Note: this should be ‘if such a failure incurs during the writing ...’)

“Base on the aforementioned ... firmware program” (pg. 4, para 3 – Note: this paragraph is constructed like a claim listing and has not correct English constructs typical of a correct English sentence should be; further, ‘base on’ should be based on).

Because the specification contains a lot more errors than can possibly be pointed out, extensive and systematic correction for more similar language and grammatical improprieties is required.

Abstract

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The instant abstract is replete with legal phraseology, e.g. using 'said' forms.

Claim Objections

4. Claims 12-16 are objected to because of the following informalities:
- a. The element 'firmware of computer device' (claims 12-16, line 1) should be corrected to become 'firmware of a computer device'.
 - b. The limitation '... for renew' (claim 14, li. 3,6; claim 15, li. 4,7; claim 16, li. 4,8) should be corrected to become '... for renewing' in order to make it more grammatically sound.
 - c. The element 'potion' (claim 13, li. 3-6) should be corrected to become 'portion'. Appropriate correction is required.
 - d. The limitations 'the first portion', 'the second portion', 'the third portion', 'the fourth portion', and 'the fifth portion' (claim 11, li. 3-5) should be corrected to become 'a first portion', 'a second portion', ..., 'a fifth portion' in order to avoid being rejected for lacking of antecedent basis. Further, 'a initial program', 'a old backup...', 'a old

firmware' in the corresponding section of the claim 11 and beyond should also make 'a' into a 'an' to make it more syntactically correct.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fichtner et al., USPN: 6,360,362(hereinafter Fichtner), in view of Forsman et al. , USPN: 6,665,813 (hereinafter Forsman), and further in view of Kitagawa et al., USPN: 6,357,021(hereinafter Kitagawa)

As per claim 11, Fichtner discloses a method for updating firmware of a computer device, comprising: dividing a memory of said device into portions, wherein an initial program is saved in a first portion (e.g. boot loader 402 – Fig. 9), an old firmware is saved in a second portion (col. 6, lines 42-44; step 208 – Fig. 7);

executing said initial program in the first portion (e.g. steps 204-206 –Fig. 7);

writing a new firmware into the second portion from an external device (e.g. step 208 – Fig. 7 – Note: getting new upgrade downloaded from host machine reads on external device to the imaging device);

executing said new firmware in the second portion (e.g. Fig. 10)

But Fichtner does not disclose a third memory portion wherein an old backup firmware is saved; nor does Fichtner disclose writing of said new firmware into the third portion for

replacing said old backup firmware. Fichtner only discloses temporarily saving a firmware code to check for error in the installation before committing the activation the imaging device once the check is error free (steps 302, 308 – Fig. 8). The practice of storing temporary copies of software or backup software in the art of software upgrade prior to ensuring the correct activation of the upgrade was a known concept in the art. Forsman, in a method for upgrading firmware using a starter program to write firmware upgrade into firmware memory analogous to Fichtner writing into the firmware block, discloses partitioning of firmware memory into sections one of which stores replacement copies of the original firmware code (e.g. *copy A*, *copy B* – Fig. 3) to ensure that those copies can backup each other in case one copy is detected as corrupted. It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a portion of firmware memory as introduced by Fichtner to store a backup of a given upgrade firmware as taught by Forsman because this configuration enables rollback process in case of installation failure according to the well known concept practiced by the art of upgrade as mentioned above; and endow the upgrading process with options (Fig. 4-5) such as suggested by Forsman to alter modifiable portions and error-checking of firmware memory prior to ensuring that these modifiable portions can be used as legitimate and error-free code with which to support the main software being upgraded.

Nor does Fichtner explicitly disclose saving and writing the checksum of said old firmware in a fourth portion and writing the checksum of the old backup firmware in a fifth portion. But Fichtner discloses identity validation and checksum validation (e.g. col. 6, lines 40-53; Fig. 6); hence implicitly discloses comparing a dynamic checksum against a pre-stored checksum, a well-known concept in the art of data integrity checking. Further, storing metadata

information (e.g. length, encrypted label, checksum, CRC, encoded identifier) distinguishing portions of memory, transmission medium, or disk storage was a known concept in data validation or integrity checking. Likewise, Fichtner discloses in a portion of the firmware memory tables containing identification data distinguishing the firmware version and entities in the firmware upgradeable portion (*image tables 409* – Fig. 9; col. 8, table 1, table 2) while Forsman, as disclosed above, also provides identification information in association with each portion of code stored in the firmware memory (*CRC* - col. 5, lines 21-39) for integrity checking test. Similar to using CRC for integrity checking, Kitawaga, in the same line of upgrading firmware using partitioning like Forsman or Fichtner to allow easy manipulation of memory sections to ensure whether code can be upgradable or not, discloses separating memory in a portion where a checksum is stored and a portion where a backup is stored (*updateable part, fixed part, checksum 254* – Fig. 2). It would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the table of identification data as suggested by Fichtner so it include a CRC as partitioned by Forsman, or to enhance such CRC with the checksum by Kitagawa, i.e. the memory firmware containing portions to store both checksum for the old firmware and checksum of the backup old firmware. One of ordinary would be motivated to do so because in view of the intention initiated by Fichtner and further enhanced by Forsman and Kitagawa, this metadata being stored within the proximity of the data blocks (e.g. first portion ... fifth portion) in the firmware partitions would expedite the process of integrity checking of such data and would alleviate access time that would be otherwise required should such metadata or CRC or checksum be located outside of the firmware memory.

As per claim 12, Fichtner discloses a camera (Fig. 3-4) but does not disclose a scanner having firmware for update but Kitagawa discloses that various devices can be a digital camera or a scanner (col. 1, lines 11-18). It would have been obvious for one of ordinary skill in the art at the time the invention was made to make the device as suggested by Fichtner a scanner because firmware is known to be stored in scanner for the same upgrade convenience and reasons why firmware can be stored in embedded systems of many devices in today's hardware technology and electronic device.

As per claim 13, Fichtner discloses verifying checksum of old firmware (step 206 – Fig. 7) and in view of the teachings by Forsman to store a CRC with each of the portions of backup code (re claim 11) and by Kitagawa for using a checksum store along with a code portion saved to determine whether the copy of the new software can be used (e.g. col. 4, lines 27-59), the limitation as to verifying the correctness of the portion of the old firmware or of the old backup firmware with the checksum being stored for each portion; and to use such verification to check identity correctness for each portion would have been obvious in light of the rationale as set forth in claim 11 and also because of the inherent technique as to use a stored checksum to verify the integrity correctness of data by matching it against a dynamically created checksum of the data in question.

As per claim 14, official notice is taken that persisting data such that any changes being applied to the data has to be also persisted not only in the data but also in its metadata was a known concept in the art of data persisting, like version control or database application. Although Fichtner does not teach writing backup firmware into the old software portion in case the latter is defective and that updating the checksum of the old defective portion with the

checksum of the backup portion, the rationale as to use backup as taught by Forsman (Fig. 4-5) and by Kitagawa (col. 4, lines 27-59) as set forth above would have render obvious the limitation as to replace a defective portion of firmware with a backup portion. In view of the official notice and teachings by Fichtner to associate identification of code with firmware code sections, the limitation as to replacing the portion of checksum related to the defective code with the checksum of the backup portion, i.e. synchronizing change in data and metadata, would also have been obvious because applying changes to data without synchronizing the information identifying such data would have taught away the very meaning of persisting or relating metadata by its corresponding data such as is the case with memory upgrade so taught or suggested by the combination Fichtner and Forsman/Kitagawa.

As per claim 15, only Forsman discloses if the backup portion is defective, replacing it with a functional and non-defective copy of the original software (Fig. 4-5). In view of the teachings that multiple copies are stored for backup and for integrity checking prior to their use as suggested by Forsman, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the integrity checking by Fichtner to include the backup storage portion by Forsman as set forth in claim 11, so that when integrity checking on even the backup portion fails (old backup firmware in third portion as claimed), another more valid and functional copy of the device firmware code(old firmware in second portion) portion can be used to supplant the backup defective copy just like Forsman replaces copy A with copy B; and copy B with A when, respectively, either A or B is detected to be defective; and by the same token upgrade the corresponding checksum as mentioned in claim 14 above. The motivation is to ensure that the code stored in the firmware is constantly and systematically ensured on their

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correctness, thus increase the guarantee of code integrity and updateability of the code as taught by Forsman.

As per claim 16, the limitation of overwriting the defective old backup program in the third portion with a old program in the second portion when a difference is detected amounts to detecting if the backup copy is defective and replacing it with the more correct copy of the original new firmware upgrade (i.e. a copy being different from the defective backup copy) and this limitation would also have been obvious by virtue using Forsman's teachings as set forth in the rationale of claim 15 above.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A Vu whose telephone number is (703)305-7207. The examiner can normally be reached on 8AM-4:30PM/Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703)305-9662.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for formal communications intended for entry)

or: (703) 746-8734 (for informal or draft communications, please consult Examiner before using this number)

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Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VAT

June 18, 2004


ANIL KHATRI
PRIMARY EXAMINER